

EXPLORING USER EXPERIENCES OF INFORMATION SYSTEMS IN HEALTH OF PATIENT SAFETY PROGRAMS: A RAPID SYSTEMATIC REVIEW.

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Abstract

Patient safety is one of the most important challenges facing healthcare organizations in the world. Patient safety programs aim to avoid the events caused to the patient during their care, through strategies aimed at guaranteeing infection control, safe use of medications, equipment, clinical practice and environment. However, errors in health care are often due to weak information systems and their causes can be corrected by identifying the incidents and events presented during the care. Each country must have solid and reliable health information systems (HIS) to generate its own data, in order to monitor the different health programs and thus report on their management. In many countries, HISs are weak, incomplete and fragmented, with problems related to infrastructure, interoperability, connectivity, lack of training and availability to health care personnel. The objective of this study was to conduct a rapid systematic review of the literature about the experiences reported by users or health professionals with the Health Information Systems of Patient Safety Programs (PSP). 98 articles were identified in the Medline database, of which 5 articles with a qualitative approach were included. The results showed problems with the definition of concepts related to patient safety, fear of professionals to report events or incidents, reluctance to use HIS due to interoperability or communication problems. The qualitative studies related to HIS of the PSP are scarce and the publications found have been carried out in countries such as Iran, Taiwan, Austria, Spain and the Netherlands.

Keywords: Patient safety, information systems, experiences, opinions

1. INTRODUCTION

Health information systems (HIS) are a mechanism for the collection, processing, analysis and transmission of the information required for the organization and operation of health services [1]. The HIS play a key role in allowing health information to be available in a timely manner for operational and strategic decision making to save lives, to improve the health and quality of life of patients [1][2]. The advantages of these systems are to improve disease surveillance, facilitate the strategic use of information, manage patients, manage health programs and increase service quality through more efficient and effective care [3].

Countries must have solid and reliable health information systems that promote patient safety and contribute to the reduction of adverse events

presented during care, generating their own data to monitor health programs and report on progress [4]. However, in many countries, HISs are weak, incomplete and fragmented, with problems related to infrastructure, interoperability, connectivity, lack of training and availability to health care personnel, which impacts the quality of care provided and, consequently, patient safety, increasing the number of adverse events and incidents presented during the care [2], [5].

Patient safety is one of the most important challenges facing healthcare organizations in the world. According to the World Health Organization (WHO), one in every 300 patients suffers damage during medical care and frequently the errors in health care are due to weak information systems and their causes can be corrected, identifying incidents and events submitted that may go unnoticed if not

notified or analyzed [6]. Patient safety programs are intended to avoid the events caused to the patient during their care through strategies aimed at ensuring infection control, safe use of medications, use of equipment, clinical practice and the environment.

Notification is a fundamental step in detecting patient safety problems; however, there is a notable reluctance of doctors to report incidents [7]. The causes appear to be multifactorial and include time constraints, fears of legal consequences, lack of clarity on what to report and little information related to the incidents, making it more difficult to find strategies to mitigate those causes that negatively influence patient safety [7].

Patient safety is a constant challenge and the complexity of the factors that may compromise it requires a continuous search for new knowledge to improve health information systems focused on patient safety. Therefore, the objective of this work was to carry out a rapid systematic review of the literature that allowed to know the reported experiences of users or health professionals with the health information systems of patient safety programs, this information will enhance future research to analyze the events and incidents presented in hospital institutions, generating tools for risk management.

2. MATERIALS AND METHODS

A literature review was conducted based on the methodology of rapid systematic review. Rapid reviews are a form of knowledge synthesis that follows the systematic review process, but the components of the process are simplified or omitted to produce information in a timely manner that allows supporting urgent and emerging decisions related to clinical and political practice [8], [9].

The review was focused on selecting original primary articles related to the experiences or opinions of users or clinical professionals regarding Health Information Systems in Patient Safety Programs. The search was conducted in the Medline database, with the search strategy summarized in Table 1. Two of the researchers independently analyzed each of the studies found by title and summary, which were classified by categories according to their focus or central theme in order to select from them the ones that best fit the objective of the research and were subsequently analyzed by full text (Table 1). The evaluation of the quality of the included studies was carried out using the Fernández de Sanmamed and Calderón tool [10], the tool is composed of 30 questions that aim to identify the criteria that refer to the introduction, participants, methods, results, discussion and conclusion.

Table 1: Summary search strategy and categorization of information.

Database	Search Strategy	Language	Range of years	Criteria		Categorization of identified studies	Number of references found
				Inclusion	Exclusion		
Medline	"patient safety" AND ("information systems" OR "information system") AND (experience OR opinion OR attitude)	English	Not restricted	Qualitative research studies related to the documented experiences of users, healthcare personnel, doctors or nurses in relation to health information systems (HIS) in patient safety programs (PSP)	Studies aimed at evaluating health information systems in general were excluded	HIS opinions and experiences of the PSP	7
						Opinions and Experiences HIS	1
						HIS	47
						HIS(RME)*	6
		Espanish				HIS PSP	4
						HIS (CPOE)*	5
						Patient Safety	2
						Drugs	4
						Does not relate HIS and PSP	20
No found	2						

*EMR: Electronic Medical Record, * CPOE: Computerized Medical Order Entry.

3. RESULTS

Identification of articles following the proposed search strategy.

The search yielded 98 articles, of which two were duplicates and 96 studies were examined by title and abstract. After the evaluation process, seven articles were selected in full text to fulfill the research objective, of which five had the inclusion criteria.

(Figure 1). The included studies come from Spain, Iran, Taiwan, Netherlands and Austria. It was observed that the purpose of the included studies was to analyze the opinions and experiences of the users, professionals or experts in patient safety, aiming to strengthen the existing information systems using questionnaires and interviews, with a number of people inquired between 15 and 269 informant experts.

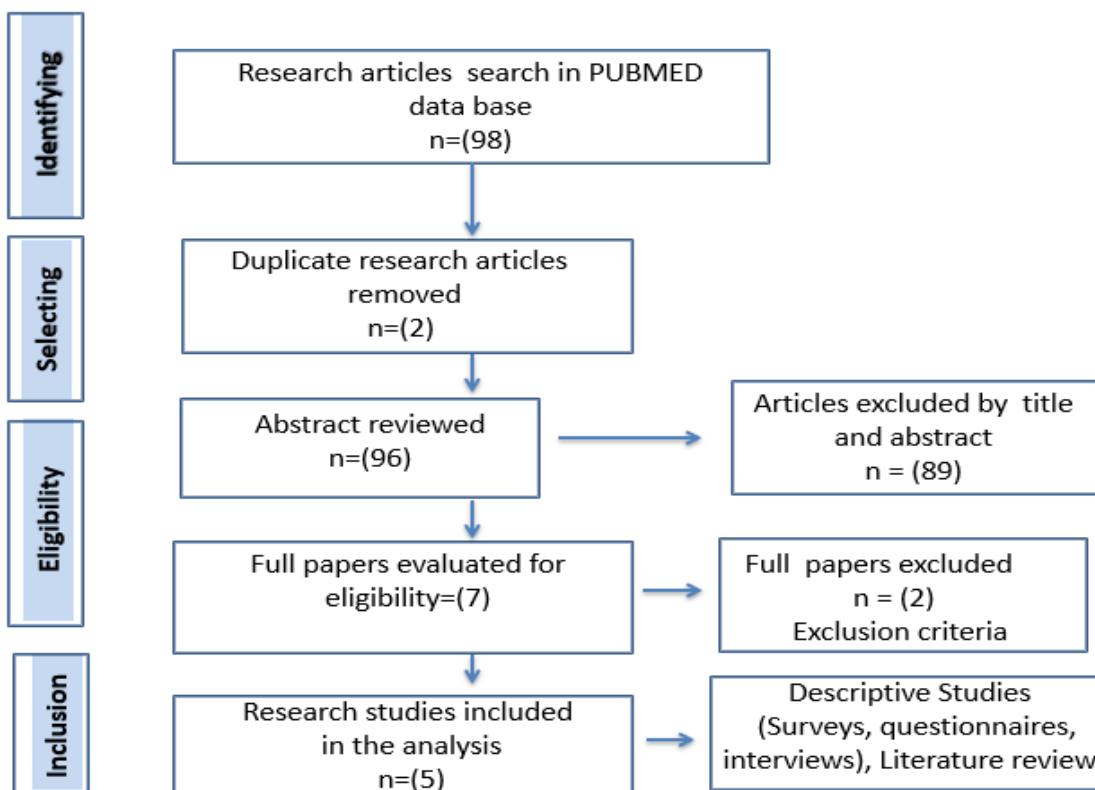


Figure 1: Prism diagram. Summary of the stages carried out for the inclusion of the studies in this rapid systematic review.

Selected studies reflect the authors' purpose to contribute to patient safety and improve health information systems. For example, the study conducted by Lizarraga et al in 2011, was characterized by seeking actions to improve the information system and the tool used was an excel form to collect information related to patient safety in health centers in Madrid, Spain. In the study, questionnaires were made with open questions that allowed identifying the opinions of 45 heads of the Functional Units of Health Risk Management (FUHRM) regarding the tool used and knowing the adherence to the tool, in terms of understanding, usefulness, adequacy and difficulties in its use [11].

People responsible for the intervened FUHRM considered that the tool was useful. However, they indicated difficulties related to errors in cells and formulas, adaptation and duplication of records, classification of incidents or adverse effects and inexperience of the staff completing the form. In relation to the aspects to be improved, the participants considered it important, for example, to include a more specific description of the cases presented that allow defining criteria to classify them, avoiding duplication of records and errors presented with medications. Likewise, they proposed conducting surveys on the perception of safety in the different health centers and implementing practices that have had favorable results in other care centers.

The information collected from the study proposed by Lizarraga et al, allowed establishing strategies according to the needs presented to intervene in HIS and make it more accessible, systematic, complete and useful for the organization.

In the study published by Sheikhtaheri et al [12], they focused on contributing to the interest of the Ministry of Health of Iran, to improve the quality of medical care and to implement patient safety programs (PSP) in hospitals. Descriptive study developed by the authors, a review of literature and interviews directed to hospital directors, clinical governance office staff, accreditation, complaint management and medical device offices was conducted. The information obtained from the review was intended to find guidelines for developing a PSP HIS according to developed countries such as Australia, the United States and England and the interviews allowed to know the current status of existing HIS in Iran for the analysis of errors and medical incidents.

Those interviewed in the study agreed that it was necessary to design a system to record and analyze medical errors and adverse events in Iranian hospitals, neglecting their analysis based solely on the reception of patient complaints. In addition, they pointed out that it was essential to form an HIS of the PSP that collects the necessary and relevant information where solutions are analyzed and formulated that promote patient safety, including more programs, since currently, there are only systems for reporting adverse drug events. and nosocomial infections in Iran.

In the same study described by Sheikhtaheri et al, it was identified that there is no clarity in the definition of concepts related to patient safety, which negatively impacts the reporting of incidents or adverse events. In addition, they reaffirmed the importance of generating reports and newsletters containing the lessons learned from the events presented, generating patient safety indicators (PSI), to monitor adverse events and even more so that those involved report everything that happened, incidents and adverse events without error and without harm to patients.

The analyzes of each of the reports presented have generated useful and necessary information for health organizations to design and implement strategies for patient safety (PS). In that direction Michael Schaller et al in 2018 [13], considered the

use of information technology (TI) and the reuse of existing clinical data within hospital information systems to improve PS essential. In that study by Michael S et al, they interviewed a group of 20 experts from Austria with the objective of knowing their opinions regarding the main problems and challenges in PS, the use of clinical data and PS indicators. Similar to the study by Sheikhtaheri et al, the authors stated that it was necessary to have a clear definition of the concepts related to PS, referring that some of their main problems are related to the quality of the structure, processes and results.

By going deeper into the data, it is observed that in the structure component, aspects such as staffing, training, education and experience are mentioned. Regarding the quality of the process, emphasis is placed on the poor interoperability of information systems, the adverse effects associated with the prescription, transcription, dispensing or similarity of medications. The interviewees also emphasized the affectation of trust between the professional and the patient, regarding the insecurity that the patient reflects when receiving a medical treatment or a diagnosis, which is perceived by the professional who attends it, what is known as social interaction problems between patient-medical professional. Finally, in terms of the quality of the reported results, they expressed difficulties in quantifying the percentage of damages caused to the patient during the care, for example, those related to the quantification of the proportion of infections or pneumothorax that cause the adverse effects.

Regarding the question, ¿how to measure the PS? there is no consensus in the answer. Some do not consider it measurable, while other professionals claim that by implementing nursing rounds, checklists and risk assessments, electronically documented, facilitate the implementation of indicators and allow to know the prevalence of the damage caused. On the other hand, the use of Information Technology (TI) was highlighted as an essential tool to control prescriptions and measure drug interactions.

When asking about the challenges in PS, respondents also stated that a clear definition of PS is essential, improve the interoperability of HIS, strengthen the correct use of TI, taking into account user experience and implement the use of Complete and accessible electronic documentation, which could be a fundamental pillar for the creation of indicators as a

tool for the prevention of damage caused to patients during care.

In the study conducted by Chiau Chang et al. In 2011, through surveys of health professionals in Taiwan, researchers identified the causes that health professionals indicated for not using the national online patient safety reporting system (PSRS), through of the theory of acceptance and use of technology (UTAUT), a tool that allows determining the factors that induce a human being to accept or not, use a certain technology in relation to gender, age, experience and occupation [7].

Additionally, in this study most respondents were nurses, over 30 years old, who had more than 5 years of work experience and worked in regional hospitals. The study showed that doctors and nurses were the professionals who used PSRS the most and that the professional's age was inversely related to the use of PSRS. According to the study, an older professional was less willing to use it, probably because of the lack of experience and anxiety with the use of technology. Another finding reflected the importance for men that notification reports were anonymous and had no legal or labor consequences. Consequently, the authors suggest as a strategy to encourage the effective use of PSRS, provide training to professionals involved in PS taking into account gender, age, occupation and experience.

The study carried out by Campmans et al, showed that 41% of all the incidents presented with medicines in the community pharmacies of the Netherlands, were related to TI and were related to the moment of incorrect selection or the concentration used of the drug, due to the similarity of names or in some cases, similar concentrations [14]. A repeated number of alerts have been generated as a prevention to avoid falling into the error, however, this has caused "Alert Fatigue" and the Pharmacists have ended up ignoring them, due to the high display of pop-up windows when accessing the information system.

Therefore, the researchers proposed to develop a strategic alert to reduce the "Fatigue" in the information systems of the Pharmacies and, therefore, avoid falling into dispensation errors. For this, an online questionnaire was conducted addressed to Pharmacists to know their experience with the established alerts, among which stand out, alternate upper and lower case letters, confirm the

dose, and thus, avoid confusion of the name and concentration of the drug.

In the same study, most respondents noted that alerts implemented in the system related to name and concentration were enough. While they recommended, add color to the differences in the letters of the names of the medications and bold for the differences in the numbers of the concentrations, increase the size of the pop-up window that indicated the alert, continue with the alerts that caused serious incidents for confusions and to establish the alerts from the prescription, since the error sometimes, was produced from the beginning by the medical professional.

4. DISCUSSION

The studies reviewed show common problems faced by health organizations to ensure PS. For example, research in Taiwan, Iran, Austria and the Netherlands suggests that there is no clarity in the definition of fundamental concepts related to PS (damage, event, incident, alert), which prevents having a clear diagnosis of the situation and, therefore, generates confusion when notifying the events and incidents presented to the patient during their care.

According to the review carried out in Iran, not all hospitals have notification systems, the information available is related to patient complaints or lawsuits. While in Taiwan, professionals, especially men, are afraid to report what happened and fear of being sued or punished.

The studies by Lizarraga et al, Schaller et al and Sheikhtaheri et al, suggested analyzing and classifying the cases presented [11] [12] [13]. These studies reiterate the importance of generating indicators to measure patient safety and analyze the data collected. In addition, they recommend that documentation be done electronically, complete and structured. Also, that the relevant data is accessible and duplication of information is avoided.

In the study by Chiu Chang et al, a certain predisposition to the use of new technologies by health professionals was found, which causes not to be informed about incidents or events and for this reason, they recommended motivating the use of HIS considering factors such as gender, occupation, experience and age of staff [7]. In contrast, in the study by Schaller et al [13], it is mentioned that the source of possible incidents in patient safety are communication-related problems, especially poor

interoperability or non-flow of information in HIS [13].

Finally, regarding the safety of medications, the studies by Schaller et al [13] and Campmans et al [14] agree on the importance of controlling side effects and similarity problems in the name and concentration of medications, as well as prescription, transcription and dispensing errors, as they are the events associated with more frequent medications [13] [14]. It is important to highlight that only one study was found where it would be important to evaluate the loss of mutual trust between the health professional and the patients caused by the problems of SP [13]. This fact implies that the scientific community must direct new research that will better clarify the perceptions of the users of patient safety systems.

5. CONCLUSIONS

Health information systems have allowed advances in patient safety. However, in some cases they have been the cause of incidents or events that have put the health of patients at risk. The review of the studies that evaluated the experiences of the users, allows to identify some problems and challenges that professionals face with their use of these systems.

The qualitative studies oriented to the HIS of the PSP are scarce and the publications found are from countries apart from the Americas. Three of them are from Europe and two from Asia.

6. LIMITATIONS

Being a rapid systematic review, the information obtained may be limited by establishing as a source of identification of the specialized scientific literature, a database, including only English and Spanish literature.

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